

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method for the spatially resolved polarimetric examination of an imaging beam pencil ~~(1)~~ generated by an associated ~~a~~ radiation source ~~(9)~~ of pulsed operation, having the following steps comprising:
 - ~~introduction of~~ introducing a first photoelastic modulator ~~(6a)~~, a second photoelastic modulator ~~(6b)~~ and a polarization element ~~(5)~~ serially into a path of the beam pencil ~~(1)~~,
 - ~~activation of~~ activating a first modulation oscillation of the first photoelastic modulator and a second modulation oscillation of the second photoelastic modulator,
 - ~~use of a pulsed radiation source (9) for generation of~~ generating the beam pencil and driving of the radiation source for outputting a respective radiation pulse in a manner dependent on the oscillation state of at least one of the first photoelastic modulator ~~and/or~~ and the second photoelastic modulator, and
 - ~~spatially resolved detection of~~ detecting the beam pencil coming from the polarization element ~~(5)~~ with a spatially resolving detector.

2. (currently amended): The method as claimed in claim 1, wherein the first and second modulation oscillations are activated with different oscillation frequencies, and further comprising performing a plurality of measurement operations ~~are carried out~~ for different phase angles of the two modulation oscillations of the photoelastic modulators and determining a spatially resolved Stokes vector ~~is determined on the basis of~~ from results of the measurement results ~~operations~~ utilizing the spatially resolving detector.

3. (currently amended): The method as claimed in claim 2, wherein at least four of the measurement operations are carried out respectively for the phase angle pairs ~~(α , β), (α , $\beta + 90^\circ$), ($\alpha + 90^\circ$, β) and ($\alpha + 90^\circ$, $\beta + 90^\circ$))~~ (α_1 , α_2), (α_1 , $\alpha_2 + 90^\circ$), ($\alpha_1 + 90^\circ$, α_2) and ($\alpha_1 + 90^\circ$, $\alpha_2 + 90^\circ$)) of the phase angles of the two modulation oscillations of the photoelastic modulators, where ~~α and β~~ α_1 and α_2 designate ~~predeterminable~~ predetermined phase angles.

4. (currently amended): The method as claimed in claim 3, wherein the phase angles ~~α and β~~ α_1 and α_2 are both predetermined as 0° .

5. (currently amended): The method as claimed in claim 2, wherein the difference between the oscillation frequencies of the two photoelastic modulators ~~is chosen to be~~ in the range of between 0.1 kHz and 10 kHz.

6. (currently amended): The method as claimed in claim 5, wherein the oscillation frequency difference is ~~chosen to be in the region of~~ around 1 kHz.

7. (currently amended): The method as claimed in one of claims 1 to 6, ~~wherein an imaging beam pencil off~~ further comprising introducing a sample system ~~introduced~~ into the beam path of the beam pencil ~~is examined~~.

8. (original): The method as claimed in claim 7, wherein the sample system is a projection objective of a microlithography projection exposure apparatus.

9. (currently amended): The method as claimed in claim 8, ~~wherein the examination of the imaging beam pencil furthermore comprises~~ further comprising performing an interferometric wavefront measurement of the projection objective using the beam pencil.

10. (currently amended): The method as claimed in claim 7, wherein the two photoelastic modulators are positioned at essentially ~~the same distance (a)~~ equal distances from a convergence point ~~(7)~~ of the beam pencil.

11. (currently amended): An apparatus for the spatially resolved polarimetric examination of an imaging beam pencil ~~(1)~~, having comprising:

- a pulsed radiation source ~~(9)~~ for generating the beam pencil,

- a first photoelastic modulator-~~(6a)~~, a second photoelastic modulator-~~(6b)~~ and a polarization element-~~(5)~~, which can be each positioned ~~serially~~ in ~~the~~ beam path of the beam pencil,
- a control unit ~~(8) for the control of~~ controlling the photoelastic modulators ~~(6a, 6b) and for the driving of~~ the pulsed radiation source in a manner correlated ~~therewith~~ with the control of the photoelastic modulators, and
- a spatially resolving detector ~~(4) for the spatially resolved detection of~~ detecting the beam pencil coming from the polarization element.

12. (currently amended): The apparatus as claimed in claim 11, wherein an evaluation unit-~~(10)~~ is provided, which determines a spatially resolved Stokes vector on the basis of the detection information from the detector-~~(4)~~.

13. (currently amended): The apparatus as claimed in claim 11, ~~wherein it is set up~~ with a sample system inserted into the beam path of the beam pencil and configured for the spatially resolved polarimetric examination of ~~an~~ the imaging beam pencil ~~of a sample system~~.

14. (original): The apparatus as claimed in claim 13, wherein the sample system is an optical imaging system and the examination comprises a pupil-resolved interferometric wavefront measurement of the optical imaging system.

15. (original): The apparatus as claimed in claim 14, wherein the sample system is a microlithography projection objective.